

# ES933H & ES933WH

Hypercardioid Condenser Hanging Microphones

 **audio-technica**

engineered sound® microphones



## Features

- **Uniform hypercardioid polar pattern with 100° acceptance angle**
- **Low-profile design with low-reflectance finish for minimum visibility**
- **Superior off-axis rejection for maximum gain before feedback**
- **UniGuard® RFI-shielding technology offers outstanding rejection of radio frequency interference (RFI)**
- **UniSteep® filter provides a steep low-frequency attenuation to minimize pickup of undesired ambient noise**
- **Available interchangeable elements permit angle of acceptance from 90° to 360°**
- **Steel hanger positions microphone over choirs, instrumental groups and theater stages**
- **Available in two colors: black (ES933H) and white (ES933WH)**

## Description

The ES933H is a wide-range miniature condenser microphone with a hypercardioid polar pattern. It is designed for quality sound reinforcement, professional recording, television and other demanding sound pickup applications. The combination of small size and excellent response makes the microphone ideal for suspension over choirs, instrumental groups or theater stages.

The microphone requires 11V to 52V phantom power for operation.

The microphone is equipped with UniGuard® RFI-shielding technology, which offers outstanding rejection of radio frequency interference (RFI).

The microphone's hypercardioid polar pattern provides a 100° angle of acceptance. Additional interchangeable elements with omnidirectional (360°), cardioid (120°) and MicroLine® (90°) pickup patterns are available.

The microphone includes a 15.2 m (50') permanently attached miniature cable. Its free end connects to the provided AT8538 power module via a special TA3F-type connector designed to optimize RFI immunity. The output of the power module is a 3-pin XLRM-type connector.

A recessed switch in the power module permits choice of flat response or low-frequency roll-off (via integral 80 Hz high-pass UniSteep® filter) to help control undesired ambient noise.

The microphone comes equipped with a power module, a vinyl-coated steel hanger for positioning over a choir/orchestra/stage, and a two-stage foam windscreens. The microphone is enclosed in a rugged housing with a low-reflectance black finish. It is also available with white housing, cable, hanger and windscreens as the ES933WH.

## Installation and Operation

The ES933H requires 11V to 52V phantom power for operation.

A uniform 100° angle of acceptance provides well-balanced audio pickup. The microphone should be located forward of the front-most source, above the rear-most source, and "aimed" between them (Fig. 1). Increasing the height of the mic above the sources will tend to equalize sound levels between them, but may also increase background/reverberant sound pickup. When possible, the distance from the mic to the rear-most source should be no more than twice the distance to the front source, to maintain front-to-rear balance (Fig. 1).

Width of pickup is approximately 2.5 times the distance to the closest performer. If additional mics are needed for wide sources, they should be positioned apart laterally at least 2.5 times the distance to the front source, to avoid phase cancellation (Fig. 2).

To orient the microphone in the proper direction, twist the housing slightly in its wire holder. (Clockwise rotation moves the microphone to the right; counterclockwise rotation moves it to the left.)

Output is low impedance (Lo-Z) balanced. The signal appears across Pins 2 and 3; Pin 1 is ground (shield). Output phase is "Pin 2 hot" — positive acoustic pressure produces positive voltage at Pin 2.

The provided two-stage foam windscreens simply snaps over the head of the microphone, effectively reducing noise from wind or ventilation air currents.

An integral 80 Hz high-pass UniSteep® filter provides easy switching from a flat frequency response to a low-end roll-off. The roll-off position reduces the pickup of low-frequency ambient noise (such as traffic, air-handling systems, etc.), room reverberation and mechanically coupled vibrations. To engage the UniSteep® filter, use the end tip of a paperclip or other small pointed instrument to slide the switch toward the "bent" line.

Avoid leaving the microphone in the open sun or in areas where temperatures exceed 110° F (43° C) for extended periods. Extremely high humidity should also be avoided.

**Note:** Audio-Technica has developed a special RFI-shielding mechanism, which is an integral part of the connectors in the Engineered Sound® line. If you remove or replace the connector, you may adversely affect the unit's RFI immunity. Audio-Technica offers a crimp tool (ATCT) and RFI shields that enable you to shorten the cable and correctly reinstall the connector while maintaining the highest level of RFI immunity.

## Architect's and Engineer's Specifications

The microphone shall be a fixed-charge condenser designed for permanent installation or portable applications. It shall have a hypercardioid polar pattern with a uniform 100° angle of acceptance and a frequency response of 80 Hz to 20,000 Hz. It shall be capable of

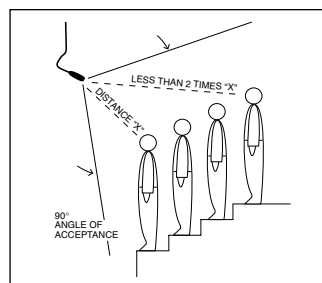


Figure 1

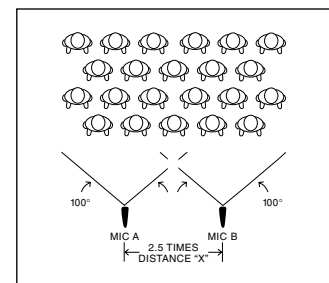


Figure 2

## ES933H & ES933WH

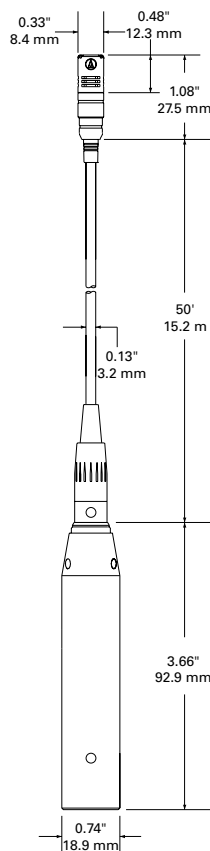
accepting optional interchangeable elements for additional polar patterns. The microphone shall operate from an external 11V to 52V DC phantom power source. It shall be capable of handling sound input levels up to 138 dB with a dynamic range of 109 dB. Nominal open-circuit output voltage shall be 10.0 mV at 1 V, 1 Pascal. Output shall be low impedance balanced (250 ohms). It shall offer outstanding rejection of radio frequency interference (RFI).

The microphone shall have a permanently attached 15.2 m (50') miniature cable terminating in a special TA3F-type output connector designed to optimize RFI immunity. The output connector shall connect to a TB3M-type jack on the included power module. The power module shall contain a recessed switch to permit choice of flat response or 80 Hz low-frequency roll-off. The output of the power module shall be a 3-pin XLRM-type connector.

An adjustable steel wire hanger shall be provided for suspended installations. The steel wire hanger shall attach to the microphone body and allow for the positioning of the microphone without the need for tools. A two-stage foam windscreen shall also be included.

The microphone shall be a hanging design, with an overall length of 27.5 mm (1.08") and a head diameter of 8.4 mm (0.33"). Weight shall be 5.5 grams (0.2 oz) without cable. The microphone, cable and steel hanger shall be black [white].

The Audio-Technica ES933H [ES933WH] is specified.



### Specifications

<b>Element</b>	Fixed-charge back plate, permanently polarized condenser
<b>Polar pattern</b>	Hypercardioid
<b>Frequency response</b>	80-20,000 Hz
<b>Low frequency roll-off</b>	80 Hz, 18 dB/octave
<b>Open circuit sensitivity</b>	-40 dB (10.0 mV) re 1V at 1 Pa
<b>Impedance</b>	250 ohms
<b>Maximum input sound level</b>	138 dB SPL, 1 kHz at 1% T.H.D.
<b>Dynamic range (typical)</b>	109 dB, 1 kHz at Max SPL
<b>Signal-to-noise ratio<sup>1</sup></b>	65 dB, 1 kHz at 1 Pa
<b>Phantom power requirements</b>	11-52V DC, 2 mA typical
<b>Switch</b>	Flat, roll-off
<b>Weight</b>	Microphone: 5.5 g (0.2 oz) Power module: 81 g (2.9 oz)
<b>Dimensions</b>	Microphone: 27.5 mm (1.08") long, 8.4 mm (0.33") head diameter Power module: 92.9 mm (3.66") long, 18.9 mm (0.74") diameter
<b>Output connector</b>	Power module: Integral 3-pin XLRM-type
<b>Cable</b>	15.2 m (50') long (permanently attached to microphone), 3.2 mm (0.13") diameter, 2-conductor shielded cable, terminated with TA3F-type connector
<b>Optional interchangeable elements</b>	ESE-O omnidirectional (360°) ESE-C cardioid (120°) ESE-ML MicroLine® (90°)
<b>Audio-Technica case style</b>	M25
<b>Accessories furnished</b>	
<b>ES933H</b>	AT8538 power module; AT8452 steel hanger; AT8109 two-stage foam windscreen
<b>ES933WH</b>	AT8538 power module; AT8452(WH) steel hanger; AT8109(WH) two-stage foam windscreen

In the interest of standards development, A.T.U.S. offers full details on its test methods to other industry professionals on request.

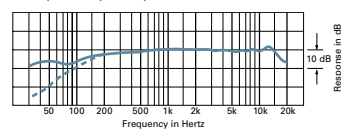
1 Pascal = 10 dynes/cm<sup>2</sup> = 10 microbars = 94 dB SPL

<sup>1</sup> Typical, A-weighted, using Audio Precision System One.

Specifications are subject to change without notice.

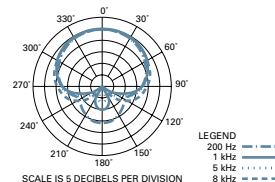


### frequency response: 80–20,000 Hz



LEGEND — 12° or more on axis  
--- Roll-off

### polar pattern



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